

Calculus Warm Up # 8-5

Solve:

$$1. \quad 3^{x+5} = \frac{1}{81}$$

$$2. \quad e^{-4x} = \left(\frac{1}{e}\right)^{(2x+5)}$$

3. Simplify:

$$[(8^{-1})(8^{\frac{2}{3}})]^3$$

4. Factor:

$$2e^{2x} + 5e^x - 12$$

Questions on WS #2

78 The radius of a circle is decreasing at a constant rate of 0.1 centimeter per second. In terms of the circumference C , what is the rate of change of the area of the circle, in square centimeters per second?

given: $\frac{dr}{dt} = -0.1 \frac{\text{cm}}{\text{sec}}$

$$C = 2\pi r$$

$$\frac{C}{2\pi} = r$$

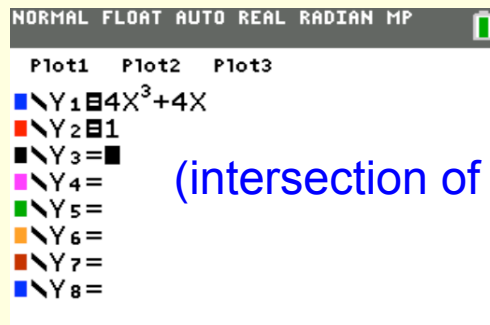
$$\frac{d}{dt} [A = \pi r^2]$$

plug in r + $\frac{dr}{dt}$

83. If $a \neq 0$, then $\lim_{x \rightarrow a} \frac{x^2 - a^2}{x^4 - a^4}$ is

Factor difference of squares on the top and bottom, simplify, then take the limit!

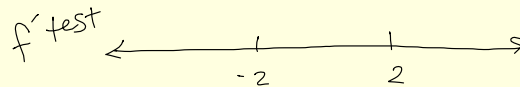
87) Use grapher to find x-coordinate of the pt. of tangency:



Now find the y in $f(x)$ and use pt. slope form to get the equation.

89. If g is a differentiable function such that $g(x) < 0$ for all real numbers x and if $f'(x) = (x^2 - 4)g(x)$, which of the following is true?

$$f'(x) = (x+2)(x-2)(-)$$

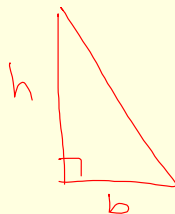


90. If the base b of a triangle is increasing at a rate of 3 inches per minute while its height h is decreasing at a rate of 3 inches per minute, which of the following must be true about the area A of the triangle?

given:

$$\frac{db}{dt} = \frac{3 \text{ in}}{\text{min.}}$$

$$\frac{dh}{dt} = -\frac{3 \text{ in}}{\text{min.}}$$



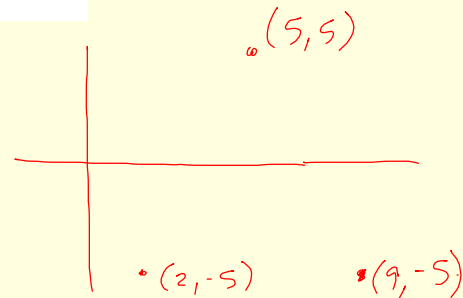
$$\frac{d}{dt} \left[A = \frac{1}{2}bh \right]$$

need product rule!

91. Let f be a function that is differentiable on the open interval $(1, 10)$. If $f(2) = -5$, $f(5) = 5$, and $f(9) = -5$, which of the following must be true?

- I. f has at least 2 zeros.
- II. The graph of f has at least one horizontal tangent.
- III. For some c , $2 < c < 5$, $f(c) = 3$.

implies -
continuous, so
imagine connecting
the points.



HW:

AP Review WS # 3 due Monday

(Check answers online tonight.

Next slide.)

Period 3: I handed out WS # 4 to 4th period.
I scanned it for you if you want to get started.
Due next Thursday, so you can pick it up
Monday if you would rather.

Answers to Rev WS #3:

2. A

4. D

5. E

8. C

11. E

12. B

13. A

14. C

15. B

17. A

21. E

79. C

81. A

82. B

86. A